

Trends in U.S. Mercury Emissions



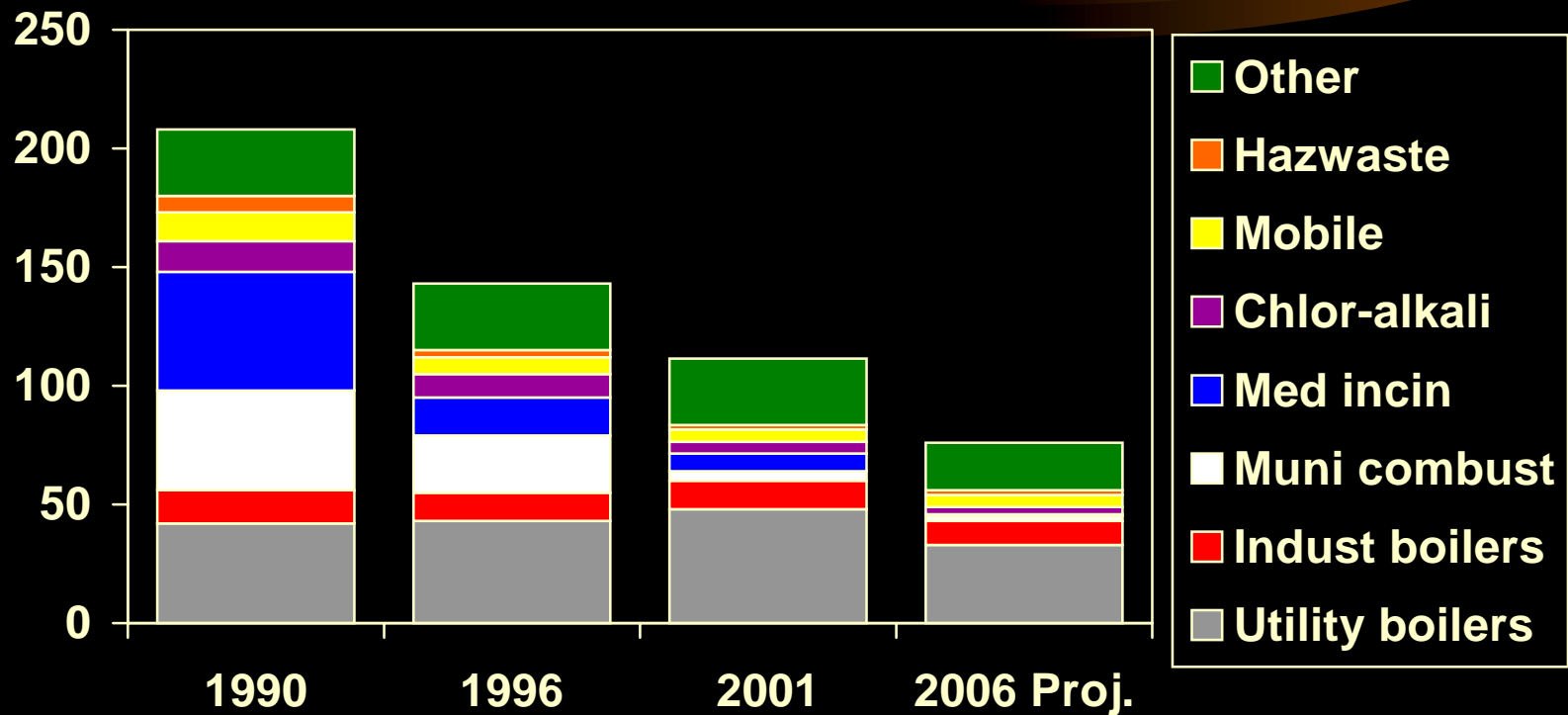
Alexis Cain, U.S. Environmental
Protection Agency

Overview



- Trends in Emissions Inventory
- Emissions not included on inventory
- Future: regulations; technology change
- Relationship between changes in emissions and environmental measures
- What should we be working on?

U.S. Mercury Releases (tons)

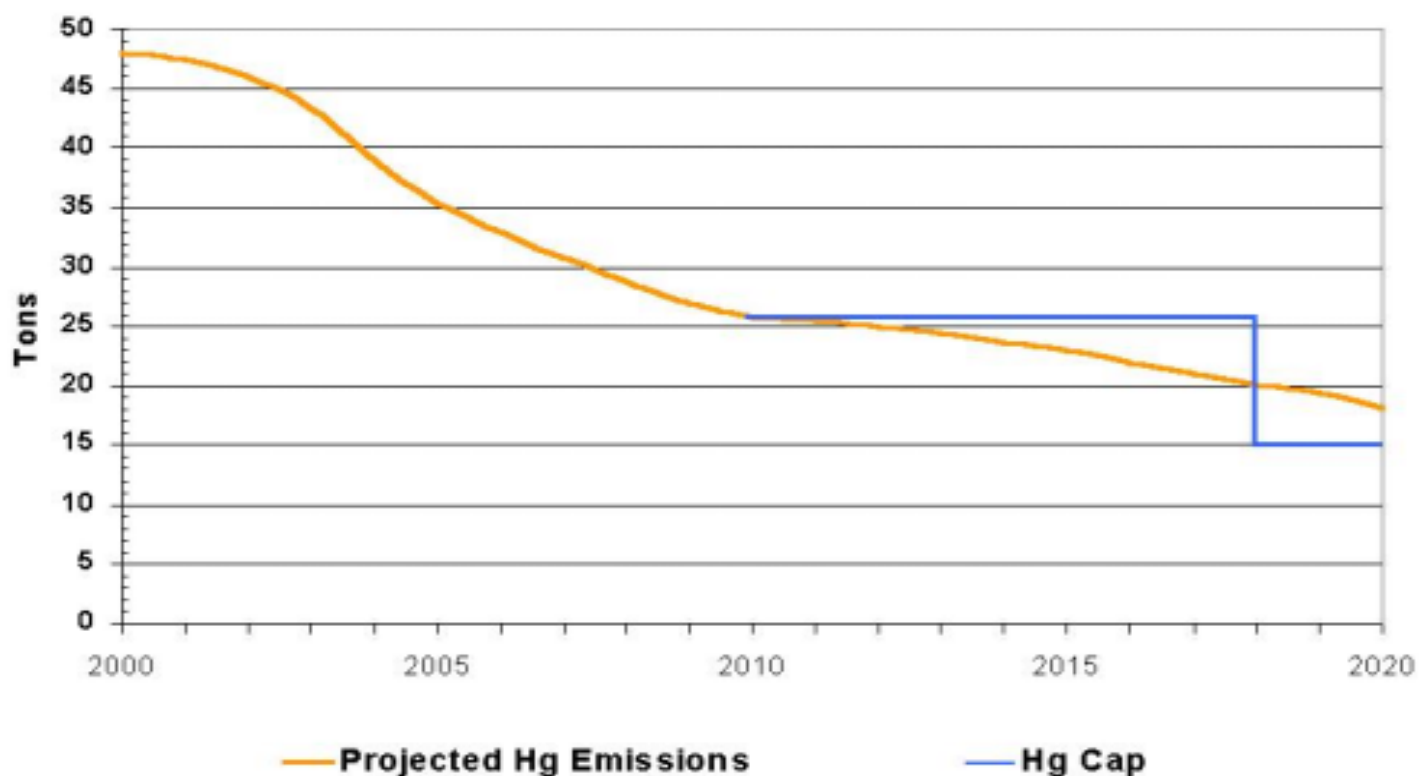


Emissions from Use of Raw Materials with Trace Mercury



- 1990s: Increased coal combustion at electric utilities; decreased coal use by industry
- The future
 - Multi-pollutant legislation for utilities: 70% reduction? MACT standard?
 - MACT for coal-fired industrial boilers: minor reductions; Portland cement: no reductions
- Other sources: Oil refining? Aluminum?

Hg Emissions from Electricity Generators: Emissions Compared to the Cap under the Clear Skies Initiative



Emissions from Use of Raw Materials with Trace Mercury

	1990	2000	2006	2020
Electric Utilities	43	48	33	18
Industrial Boilers	14	12	10	11?
Portland Cement	4	5	5	5?

Incineration



- Rapid decrease in mercury content of solid waste
- Incinerator regulations—compliance required already for large municipal incinerators; hospital incinerators by September 2002

Incinerator Emissions

	1990	2000	2006	2020
Municipal incinerators	42	4	3	2
Hospital incinerators	50	8	1	1
Hazardous Waste Incinerators	7	2	2	1

Chlor-alkali Emissions



- Significant uncertainties
- Major voluntary use reductions, 1995-2002:
Achieved through reduction in air emissions?
- MACT Standard (proposed summer 2002?)
significant reductions from point sources;
stricter cell room housekeeping practices
and air monitoring requirements

Chlor-alkali Mercury Purchases and Emissions

	1990	2000	2006	2020
Purchases	247	86	<30	?
Emissions	13	5	1	?

Major Sources Absent from EPA's Inventory

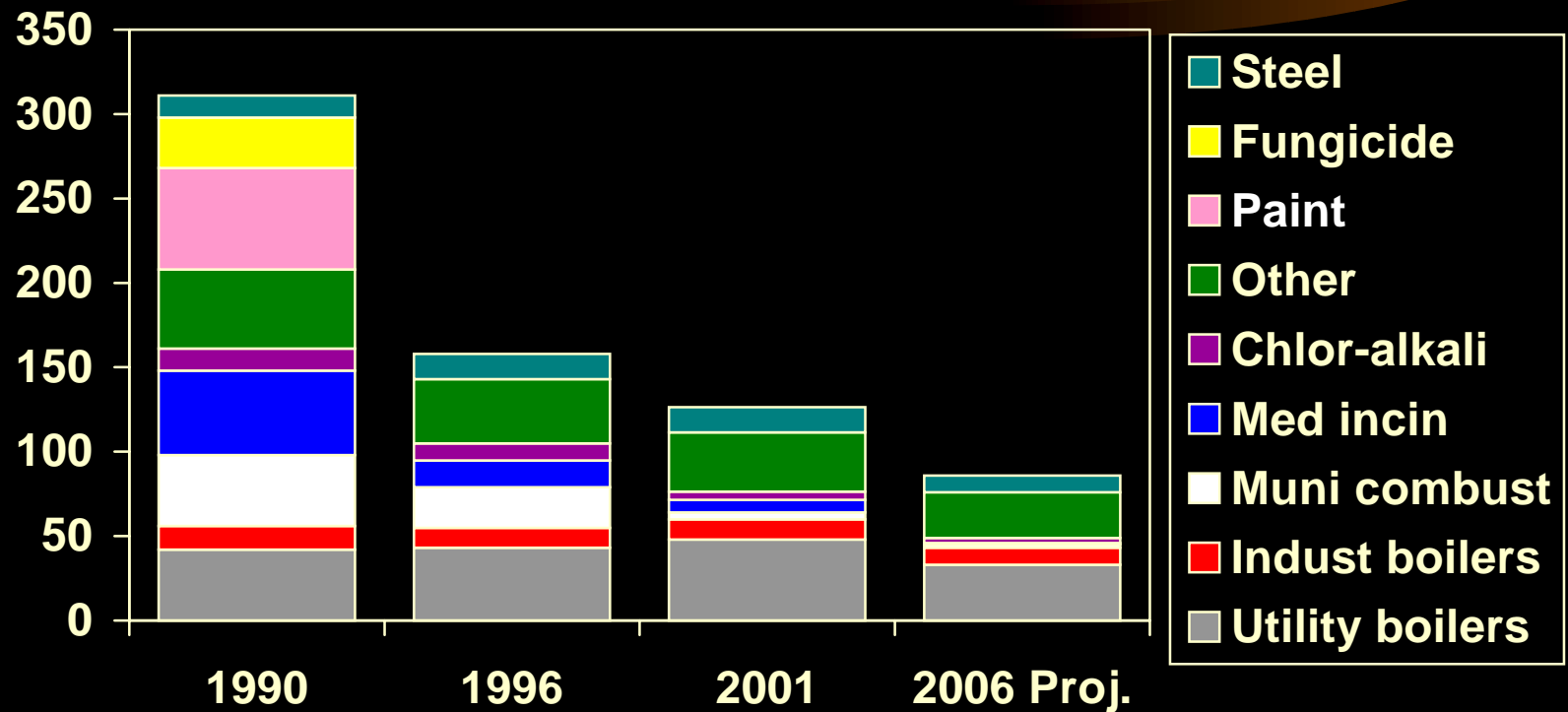


- Significant dissipative hg use in fungicides, including in paint, until early 1990s
- Rough estimates derived from Canadian data (10x) and Minnesota data (50x)
- Steel scrap: emissions estimates from Clean Car Campaign report, state data
- Controls through State programs, urban air toxics strategy?

Estimated Fungicide-related and Steel Scrap Emissions

	1990	2000	2006	2020
Paint	55-67	0	0	0
Other fungicides	25-34	0	0	0
Electric Arc Furnaces	10-17	10-17	?	?

U.S. Mercury Releases (tons)



Product-related releases



- From incineration, steel production, spills, landfills, and sewage sludge
- Problem solved: most batteries, paint, fungicide
- New uses solved; big remaining inventory: thermometers, manometers, auto switches
- End in sight: lamps, thermostats
- No end in sight: dental amalgam

Environmental Results



- Deposition evidence
 - Mercury Deposition Network: no strong trend
 - Some evidence in sediment cores
- MDN may miss some impacts
 - Time factors
 - Geographic factors
- Global emissions increases impacting U.S?
- Need for continued evaluation

Where are the Reduction Opportunities?



- Incinerators/chlor-alkali—significant additional reductions through MACT/voluntary efforts?
- Remaining significant sources:
 - Utilities
 - Industrial Boilers (minimal decline)
 - Portland cement
 - Steel scrap – not just autos
 - Products
 - Dental amalgam
 - Overseas sources, especially coal combustion and artisinal mining

Next Steps for the BNS



- What do you think?
- Contact: Alexis Cain, USEPA, Region 5
cain.alexis@epa.gov
(312) 886-7018